AWESOME AQUIFERS

1. **DESCRIPTION:** Students will construct an aquifer and answer questions about groundwater concepts.

   A TEAM OF UP TO: 2 **APPROXIMATE TIME**: 50 Minutes

2. **EVENT PARAMETERS:** The **supervisor** will supply score sheets, water, Station 2 resources, and Station 3 building objectives. **Students** are required to bring any materials needed to assemble an aquifer on-site. The entire aquifer is to be housed in **one transparent container not exceeding a total volume of 3 liters**. This container can be cut or punctured in advance but must be brought to the competition empty. Electric pumps/tools and commercial flow models are not allowed. Students cannot bring notes, texts, or references. An extended list of suggested materials and possible concepts are available at http://www.groundwater.org/pe/so_aa.html and may include but not limited to material such as:

   a) Sand and gravel (such as pea-sized or aquarium gravel)
   b) Modeling clay or plumber's putty
   c) Materials for wells and pumps, such as soap bottle pumps or aquarium tubing and plastic syringes. No electric or commercial pumps permitted.
   d) Well screening materials, such as nylon hose, cotton, coffee filters, etc.
   e) Sponge
   f) Aluminum foil and/or plastic wrap or sheeting
   g) Empty 35 mm plastic film canisters or equivalent
   h) Material to represent contaminants, such as food coloring or powdered drink mix
   i) Materials that could be used for remediation such as coffee filters, fabric squares, charcoal, etc.
   j) Items useful in creating or demonstrating the aquifer but that will not be part of the aquifer, such as scissors, tacks, tape, containers to hold water and/or contaminants, blank paper, pen or pencil, etc.

3. **THE COMPETITION:** Students will be given 10 minutes to complete each station.

   a) Station 1: Students take a written test on groundwater concepts and vocabulary. Questions can be multiple choice, true/false, fill in the blank, or short answer.

   b) Station 2: Students take a written test utilizing provided resources such as maps, charts, graphs, models, and scientific publications. Questions can be multiple choice, true/false, fill in the blank, or short answer.

   c) Station 3: Students build an aquifer that will explain and demonstrate concepts chosen by the event supervisor. Students may create notes at Station 3 to use at Station 4. Possible concepts include but are not limited to: recharge, discharge, connection between surface and groundwater, water table, porosity, permeability, well location and abandonment, groundwater contamination, remediation, and safe yield from an aquifer.

   d) Station 4: Students use the aquifer built at Station 3 to explain and demonstrate the required concepts to a judge(s). Information may be presented in any way or order students choose and the same demonstration may be used to explain more than one concept. Judge(s) may ask clarifying questions but only if a team has finished its demonstration and there is time remaining.

SCORING: Highest score wins. Station 1-25%, Station 2-25%, and Station 4-50%. First tiebreaker: highest score at station 4. Second tiebreaker: highest score on pre-selected questions at station 1 and 2. Answers must include units where appropriate.

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www.groundwater.org
http://www.groundwater.org/pe/so_aa.html